Integrating Multi-Vendor Software Analysis into the Lifecycle for Reliability, Productivity, and Performance, Phase I

Completed Technology Project (2009 - 2009)

Project Introduction

The goal of the proposed work is to create new ways to manage, visualize, and share data produced by multiple software analysis tools, and to create a framework for integrating diversely-sourced analysis tools into software practices, across the lifecycle, in a way that improves both reliability and productivity. Software analysis tools are used by software programmers, analysts, and managers to find potential defects in software source code, to enhance compliance with organizational development standards of practice, and to assist developers and teams in expressing and managing key information regarding design intent. While analysis tools have been shown to offer quality and productivity benefits to programmers, the present user experience limits their effectiveness and is a substantial barrier to their adoption into mainstream software development practices. Additionally, there is a growing number of tools now becoming available, and the tools are proving to have complementary capabilities, which means that groups seeking some comprehensiveness of coverage must develop multi-tool approaches. Finally, a suite of tools can produce more than 10,000 individual findings for a mid-sized software system, creating challenges for prioritization and focus. The project addresses the challenge through the development and evaluation of an analytic tool suite, called Sierra client and server, to support data management, integration, filtering, and querying of large numbers of findings drawn from multiple tools. It does this in a way that supports teams and collaboration, auditing and tracking, longitudinal analysis, interactive visualization, and management analytics.

Anticipated Benefits

NASA reliability requirements are often a leading indicator of reliability requirements for non-NASA applications, both commercial and government. They are also representative of requirements for critical systems in industry and government. By developing an experience that integrates tooling, lifecycle support, and team experience that is highly valuable to NASA developers and readily used by them in practice, SureLogic is better prepared to address the broader market. SureLogic's market strategy of developing partnerships with vendors will enable the SureLogic tools to be provisioned along with vendor environments for development and operations, both. The SureLogic tools and technology will be enhanced through this effort in several ways. First, new capabilities will be added to augment the value already provided by the tools. Second, any field evaluations undertaken will reduce the risk of adoption by any potential commercial partners. Finally, the tools will embody an understanding of NASA requirements that will make them more attractive and valuable to a broader segment of the NASA software development community. The Sierra tool, along with the JSure and Flashlight tools in the SureLogic tool suite, have been field tested on a diverse representation of mature and developing NASA mission software. These tools already have proven value to NASA, based on multiple field tests. This project builds on that experience,

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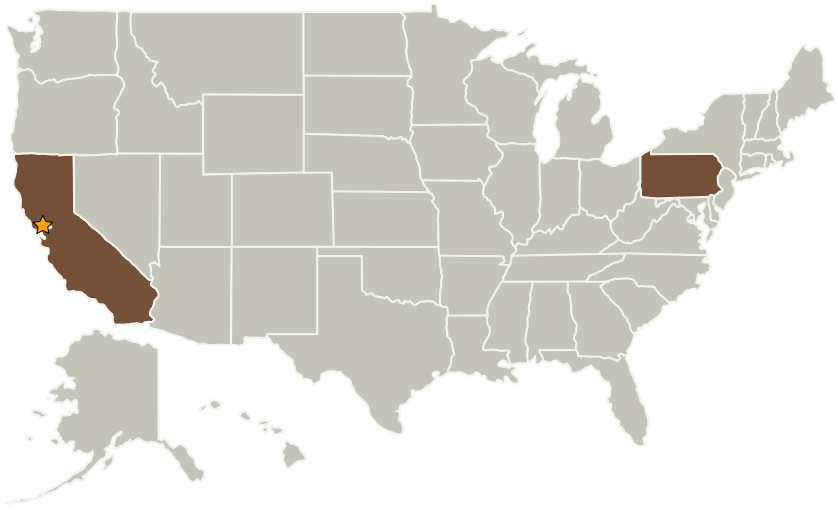
and also on the most recent developments in analysis and tooling technology, to augment that value and provide a capability that can be readily integrated with the software lifecycle in a wide range of NASA development efforts. SureLogic's strategy of developing partnerships will be enhanced through this effort in several ways. First, new capabilities will be added to augment the value provided by the tools. Second, any field evaluations undertaken will reduce the risk of adoption by any potential commercial partners. Finally, the tools will embody an understanding of NASA requirements that will make them more attractive and valuable to a broader segment of the NASA software development community.

Primary U.S. Work Locations and Key Partners



Organizations Performing Work	Role	Type	Location
★Ames Research Center(ARC)	Lead Organization	NASA Center	Moffett Field, California
SureLogic, Inc.	Supporting Organization	Industry	Pittsburgh, Pennsylvania

Primary U.S. Work Locations	
California	Pennsylvania

Organizational Responsibility

Responsible Mission Directorate:

Space Technology Mission Directorate (STMD)

Lead Center / Facility:

Ames Research Center (ARC)

Responsible Program:

Small Business Innovation Research/Small Business Tech Transfer

Project Management

Program Director:

Jason L Kessler

Program Manager:

Carlos Torrez

Project Manager:

Joseph C Coughlan

Principal Investigator:

Aaron Greenhouse

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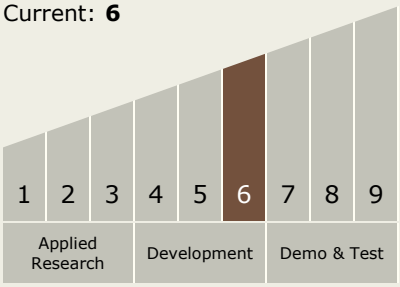
Technology Maturity (TRL)

Start: **6**
Current: **6**



Technology Areas

Primary:

- TX11 Software, Modeling, Simulation, and Information Processing
  - TX11.4 Information Processing
    - TX11.4.4 Collaborative Science and Engineering